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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/435,748	11/08/99	BUCKLEY	J N19.12-0028

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EXAMINER

RUTHKOSKY, M

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 07/17/01

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/435,748

Applicant(s)
Buckley

Examiner
Ruthk sky, Mark

Art Unit
1745



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Apr 30, 2001
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above, claim(s) 1-28, 45-51, and 55-57 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-44 and 52-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 6 20) ☐ Other: _____

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DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse of 4/30/2001 in Paper No. 5 is acknowledged.
2. Newly submitted claims 55-57 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The elected claims are to a battery while the newly added claims 55-57 are to a circuit. Therefore, claims 55-57 are withdrawn from consideration as being directed to a non-elected invention.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
4. On page 53, line 16, an application number is missing.

Claim Rejections - 35 U.S.C. § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
6. Claims 29-44 and 52-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The instant claims use the phrase "less than about." This

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phrase is indefinite as "less than" defines a lower limit, while the term "about" contradicts the value of the lower limit. In claim 34, the word "comprising" should read "comprises."

In claims 36 and 38, the limitations including "derivatives" is not clearly defined in the specification and, therefore, the words "derivative" and "derivatives" are indefinite.

Regarding claim, the word "derivative" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "derivatives"), thereby rendering the scope of the claim(s) unascertainable.

Claim Rejections - 35 U.S.C. § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 29-44 and 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Thin Film Rechargeable Lithium and Lithium-Ion Batteries, Oak Ridge National Laboratory Bulletin, 9/1/1998 (referred to as, Oak Ridge), and further in view of Amata et al. (US 5,482,797).

The instant claims are to a battery comprising a positive electrode, a negative electrode and a separator wherein at least one of the electrodes has an average thickness of 10 microns and comprises electroactive particles having an average diameter of less than about 500 nm.

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Oak Ridge teaches a thin film lithium battery which is less than 15 microns thick. The cathodes are shown to be made of LiMn_2O_4 and have a thickness of 2.5, 2.0, 1.3, 0.8 and 0.7 microns (pages 12 and 14.) Lithium and tin oxide anodes are noted in the battery. The electrode is shown to have a substrate, a current collector, a cathode, an electrolyte separator and an anode covered by a protective coating. The anode and separator electrolyte are shown to be less than 10 microns from the figure of page 7. With regard to claim 52, the surface roughness of the electrode is not taught by Oak Ridge reference. It is noted that the surface roughness of an electrode of less than 10 microns would be less than 5 microns as shown on page 7 as the materials would have to be about one-half of the thickness of the entire electrode.

The Oak Ridge reference is silent to the electrode materials having a particle size of less than 500 nm. For such thin electrodes to have particles is well known as many particles are added to form the electrode. For example, Amata et al. (US 5,482,797) teaches a nonaqueous secondary battery having carbon particles having diameters of less than 500 nm and also less than 100 nm. The materials include core metals coated with carbon. The core metals are less than 100 nm and the coated materials are also less than 100 nm (see tables 1a-d and various examples). Comparative examples show uncoated carbon particles with diameter of less than 100 nm (see col. 12 for example.) Median particle sizes and ranges of particle sizes are noted in the examples. The ranges are less than 4 times the average diameter. It would be obvious to one skilled in the art at the time the invention was made to use particles of less than 500 nm in order to prepare an electrode with a diameter of less than 10 microns as materials which are smaller

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than the electrodes are necessary to form the electrode. Electrode materials with particle sizes of less than 500 nm are noted in the prior art.


With regard to claims 39 and 41-44, it is noted that the prior art of record does not teach a polymer separator nor current collectors of aluminum, copper, or stainless steel. The examiner takes official notice (*In re Ahlert*, 424 F.2d 1088, 165 USPQ 418, 420 (CCPA 1970)) that polymer separators and polymer electrolyte separators, however, are well known in the battery art. Further, the current collectors taught in the Oak Ridge reference include platinum and nickel materials. The examiner takes official notice that current collectors of aluminum, copper, or stainless steel are also well known in the battery art. These materials perform analogous functions as the separator and current collectors of the instant invention. It would be obvious to one skilled in the art at the time the invention was made to use a battery separator material which is capable of preventing a short circuit from forming between the positive and negative electrodes as taught in the prior art. It would further be obvious to use a current collector material which is capable of transferring charge from the electrode to an electron acceptor.

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Examiner Correspondence

9. Any inquiry regarding this communication or a previous communication should be directed to Examiner Mark Ruthkosky, Ph.D., whose telephone number is (703) 305-0587 or his supervisor, Gabrielle Brouillette, Ph.D., whose phone number is (703) 308-0756. Please note that Examiner Ruthkosky is out of the office the first Friday of each bi-week period.

The art unit 1745 unofficial fax number is 703-306-3186, while the PTO official fax number is 703-305-3599.


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